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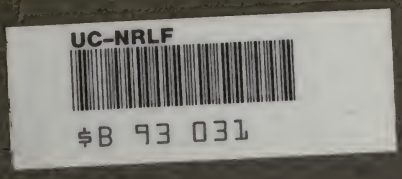

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THE AMERICAN PSYCHOLOGICAL ASSOCIATION

REPORT OF THE COMMITTEE

ON THE

ACADEMIC STATUS OF PSYCHOLOGY

A SURVEY OF PSYCHOLOGICAL INVESTIGATIONS WITH REFERENCE TO DIFFERENTIATIONS BETWEEN PSYCHOLOGICAL EXPERIMENTS AND MENTAL TESTS

PRINTED BY THE COMMITTEE

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REPORT OF THE COMMITTEE
ON THE
ACADEMIC STATUS OF PYSCHOLOGY

To The American Psychological Association:

Your Committee on the Academic Status of Psychology presents herewith its Report on the Psychological Investigations and Differentiations between Psychological Experiments and Mental Tests, as shown by a survey of the views of members of The American Psychological Association.

BIRD T. BALDWIN, *Chairman*
CHARLES H. JUDD
MARGARET F. WASHBURN
CLARENCE S. YOAKUM
V. A. C. HENMON

New York, December, 1916.

OUTLINE OF CONTENTS*

Introduction.

1. The Differentiation between Psychological Experiments and Mental Tests as shown by the views of 115 members of the American Psychological Association.
2. Factors determining emphasis on Psychological Experiments or on Mental Tests.
3. Investigations conducted last year by members of the Association.
4. Prerequisites for work in Psychological Experiments.
5. Manuals and texts in Experimental Psychology.
6. Prerequisites for work in Mental Tests.
7. Types of Mental Tests in use.
8. Manuals and texts in Mental Tests.
9. The place of "Measuring Scales in Subject Matter" in Psychology.
10. "Scales" or "Standard Tests" in use.
11. Vocational Guidance or Business Efficiency Tests.
12. Summary.

*This Report has been prepared by the Chairman, Bird T .Baldwin, after presenting a general outline of the Investigation to the Members of the Committee, who have offered helpful suggestions. The material for the Report has been secured largely through a questionary submitted to the Members of the Association and the writer wishes to thank each contributor for such splendid co-operation. Fifty letters have been received from members who are not actively engaged in experimental work but the detailed replies to eleven questions by 115 Members furnish the basis of the survey included. The Outline follows the order of the questions submitted.

INTRODUCTION

At the first meeting of the American Psychological Association, a tentative report of a series of Mental Tests was given. At subsequent meetings reports and investigations in this field of research have included studies in physical and mental tests on University Students; reports from the Committee on Physical and Mental Tests; individual tests on school children including normal, exctpions, precocious and sub-normal; tests in learning and various mental traits, including perception, memory, attention, judgment, imagery, motor co-ordination; influence of practice; general intelligence; performance tests; and tests in the school subjects of reading, writing, arithmetic, language, musical ability, vocational guidance and allied problems. During the past few years there has been a decided increase in the number of reports and investigations falling within the general field of Mental Tests. There has also been an extension of the scope of these tests and at the present time there is a tendency toward the introduction of Measuring Scales of subject matter. It is the purpose of this report to present material which will help to formulate in a tangible manner the extent to which Mental Tests are supplementing or supplanting Psychological Experiments in our laboratories and courses of instruction. It is expected that the results assembled and correlated will throw additional light on the most pronounced tendencies of present day experimental psychology and on the aims and scope of Mental Tests.

I. The Differentiation Between Psychological Experiments and Mental Tests as Shown by the Views of 115 Members of the American Psychological Association.

The fundamental principles, the points of similarity, and the factors that may be contrasted with reference to Psychological Experiments on the one hand and Mental Tests on the other, are difficult to differentiate at this formative stage of our science. The results from the replies received to the question, **From the standpoint of advancing our science, what do you consider are the fundamental differences between Psychological Experiments or Investigations on the one hand and Mental Tests on the other?** have been grouped on an empirical basis into 11 divisions without aiming to draw arbitrary lines of demarcation and with an appreciation that one opinion frequently shades into another. These views are so succinctly stated and so helpful

and suggestive in content that the writer has deemed it advisable to quote them as one criterion of the present status of our science.

In general Psychological Experiments and Investigations aim to promote Psychology as a science, formulate general facts and principles, discover new truths, analyze facts of consciousness and behavior in order to secure types or averages and secure data for an analytic systematic science. When the experiments become sufficiently standardized to be given to individuals or groups in training they become psychological exercises.

Mental Tests represent the applied side or the technology of Psychology, emphasize individual differences and attempt to diagnose or measure what is known and to determine the qualitative growth of mental traits from year to year for individuals and groups. They are based on empirical standardizations; they are not as a rule elaborated in process of application; they supplement and throw light on the theoretical problems underlying the science and if viewed critically they become material for Psychological Investigations.

1. The point of view that makes a distinction between "pure" and "applied science" and maintains that Mental Tests represent the latter phase of knowledge is supported by Angier, Breed, Breitwieser, Burnham, Calkins, Chase, Cole, G. N. Dearborn, Eno, Fernberger, Holmes, Kirkpatrick, Langfeld, T. Moore, Muensterberg, J. Peterson, Rosanoff, Rowland, Schmitt, F. Smith, Starch, Sutherland, Toll, Watson, Woolley.

I still believe in the old distinction between pure and applied science—tests being applied science. This is not to deny that work in Mental Tests often throws light on the problems of pure psychology, but it involves a regret, that the applications of psychology are in some undergraduate curricula playing so large a role.—Angier.

Mental Tests should supplement other investigations in the work of our laboratories, and not supplant. While the one type is more immediately practical, the other is to be regarded as only more remotely so.—Breed.

The Psychological Experiments as carried on in Colorado College are for the purpose of giving students a first-hand knowledge and partial demonstration of as many of the accepted psychological facts as possible as related to general courses in psychology. It is also our aim to train students in the technique of experimentation. Mental Tests, in my opinion, should be given by those who have had laboratory training. It is a special application of laboratory methods in problems of applied psychology.—Breitwieser.

The Psychological Experiments are, I take it, for the purpose of acquiring new psychological truth and for solving psychological problems. Mental Tests, on the other hand, are for the purpose of applying the psychological knowledge we already have to determine the ability and mental characteristics of individuals.—Burnham.

Mental Tests do not seem to me to be intended to "advance" psychology, but to apply it to an educational or sociological problem.—Calkins.

The main aim of Experiment and Investigation is to measure our **understanding** of human behavior. The main aim of Mental Tests is to increase our **control** of behavior. The distinction is naturally not absolute. It corresponds to that in natural science between pure science and engineering with its concrete problems.—Chase.

Mental Tests consist of empirical, rule of the thumb procedure, to bring about a practical result for one individual only. They do not advance psychology as a science, because they throw light chiefly on the differences between minds and we have not yet a science of differential or individual psychology. Perhaps the Tests are a step in that direction.—Cole.

Psychology is potentially an art, as well as a science, and may well develop this phase at the present time. But for the advancement of our knowledge of human (and brute) nature, research on a physiological basis seems certain to be more productive and so more important. Let us not neglect experimental physiologic psychology, even to further vocational psychology!—G. N. Dearborn.

The principal importance of Mental Tests seems to be in their value to applied psychology and their relation to other experiments and investigations appears to be analagous to that of the researches in applied chemistry and physics, to the more purely theoretic investigations of those sciences. I should consider their usefulness from the general standpoint of the advancing of psychology, to be, as yet, highly problematic; except in so far as the practical application of any science is always apt to throw light upon its theoretic problems.—Eno.

The question involves the entire problem of the relation of "applied" to "pure" science. Personally it would seem as if the applied science must wait for the development of the pure science—hence the applied science cannot contribute very much to the advancement of the pure science in the very nature of things.—Fernberger.

The first; at any rate, as long as Mental Tests are developed and applied as they are now, though I believe that Mental Tests can be made to yield valuable information for pure psychology.—Holmes.

Mental Tests may be an aid in scientific investigations of psychological problems, but their chief value is to be found in the application of psychology to practical affairs.—Kirkpatrick.

Mental Tests have the relation to experimental psychology that any other applied science has to pure science. The science is kept alive by application and by showing up errors in theory. The applied science stimulates further investigation, as well as lays bare new problems. A practical fact in regard to Mental Tests is that results are likely to interest the layman and induce him to aid the development of the science. The danger of too much encouragement to Mental Tests is that pure science is likely to be neglected in the laboratories, for it is generally the road of least resistance which attracts the majority of the students.—Langfeld.

"Experiments" deal with psychological "**theory**"; "Tests" are useful in Clinical or Vocational Psychology., i. e., **practical** psychology.

Psychological Experiments deal with all possible psychological research. Mental Tests are simply the application of results of experiments in a limited eld.—T. Moore.

The study of Mental Tests ought to be considered a part of applied psychology and, therefore, as lying outside of the field of theoretical experimental psychology. Yet theoretical investigations can sometimes be furthered by using Mental Tests as short cuts to the analysis of the subjects who take part in the research. Moreover, the devising of new Mental Tests for particular purposes of applied psychology may demand certain preparatory investigations which find their right place in experimental psychology.—Muensterberg.

In many instances there are no differences, e. g. cases in which tests are divided to determine nature and rate of growth from year to year of intelligence. In cases of tests like those enumerated in questions 9, 10, 11, the difference is marked; it is that of pure science versus applied science. Whenever Mental Tests emphasize the placing of certain individuals in a scheme of classification, we are dealing with applied science and not concerned directly with principles and general conceptions. Frequently such tests, however, raise problems for further investigation into the principles and facts of the pure science.—J. Peterson.

My point of view is that Psychological Experiments and Investigations have for their object the discovery of scientific principles, the construction of a basis for psychological science. Mental Tests developed, at best, by empirical standardization, have for their object the application of psychology for various practical purposes. It goes without saying that the two types of research are not to be sharply differentiated.—Rosanoff.

The standard Psychological Experiments, as outlined in most experimental manuals, seem to be for the abstract purpose of developing a technique for observation of sensory and motor phenomena, in so far as they can be reduced to their elements. They do not profess to have practical value for the interpretation of human behavior. Mental Tests do.—Rowland.

The latter is to the former as mechanics to laboratory physics. Mental Tests are the application to practical use of much of the knowledge gained through laboratory experiments and investigations.

Distinction should be made between Mental Tests and interpretation of reactions of abnormal subjects to Mental Tests, which depends upon a type of physiological psychology in which little has been done.—Schmitt.

In the former, the aim is scientific and theoretical. Our interest is in the facts and laws of mental life. Many of these will have practical value for education, business, etc., but we are not primarily concerned with these. We are also interested in the experimental method. In the latter (Mental Tests) the aim is educational and vocational. The method is scientific and experimental. The results are interpreted by means of psychological principles.—F. Smith.

I do not believe that there is any important difference between the two so far as the advancement of the science is concerned. My opinion is that the applied phases of any science contribute in the long run as much to the real progress of the science as the more purely scientific investigations do.—Starch.

Psychological Experiments are analytic systematic science. Mental Tests are applied science. It is perfectly possible to make of Mental Tests a strictly experimental science. It lies with the interest of the experimenter. So far I have seen no studies in which I think the purely scientific attitude has been taken. Whipple's studies approach it most closely.—Sutherland.

Mental Tests generally have a practical purpose: other Experiments are more theoretical in intention, I think.—Toll.

I look upon Mental Tests as the technological or applied side of a limited portion of psychological experimentation, extremely subsidiary and in no wise essential to the carrying out of work on the scientific side of psychology.—Watson.

The distinction in my mind is tersely that between the theory of a science and its practical application. It is, of course, true that the statistical treatment of the material collected by Mental Tests may have im-

portant theoretical applications, but the difference in view point still seems to me valid. Mental Tests are usually carried out with immediate reference to some practical application, whereas experimental investigations, while they may ultimately have application of the most vital importance, are primarily conducted with reference to a theoretical interest.—Woolley.

2. The view which distinguishes between "applied science" and the "applications of science" is held by Bentley.

Mental Tests are undertaken for the purpose of applying psychological and other facts in the arts of practice. Usually they are tests of capacity, of performance and of endurance. The aim of the Psychological Experiment is the description and explanation of mind. The difference of aim, of attitude, of intent, is, as I think, the fundamental difference. As a rule, differences of method of procedure and of refinement are also apparent. Frequently Mental Tests are said to pertain to "applied psychology." I should prefer to speak of the "applications of psychology" to medicine, business, education, etc. There are no more two psychologies than there are two physiologies—pure and applied.—Bentley.

3. A point of view which disclaims any distinction between "pure" and "applied science" and posits two differentiated forms of knowledge—**science and technology**—is recommended by Hamilton, Titchener, Yerkes.

Mental Tests usually have for their primary intention the solution of individual practical problems, and may, therefore, be said to be technological applications of findings which are derived from scientific experiments and investigations within the field of psychology. Although Mental Tests may yield data which are of value to the psychological sciences, they differ fundamentally from Psychological Experiments and Investigations in that they are elaborated and applied with direct reference to practical rather than theoretical problems.—Hamilton.

The difference between science and technology. "Over against science, now, stands what we have called technology. In a certain restricted meaning, this term—which we have so far employed without comment—is familiar enough; the greatly extended meaning which it is here to receive must be justified by the sequel. The word is used henceforth to cover, in the broadest way, the activities that are ordinary and misleadingly referred to as 'applied science'; such things, that is to say, as engineering and medicine, in all their branches; such things as scientific agriculture, and domestic science, and school hygiene, and industrial chemistry, and eugenics."—See Pop. Sci. Monthly, January, 1914.—Titchener.

Psychological Investigations should prepare the way for Mental Tests, which in my opinion are applications of methods, or technological efforts.—Yerkes.

4. That Psychological Experiments deal with the general laws of mental activity, while Mental Tests have as their object the revealing of individual differences is upheld by Bell, Bingham, Bolton, Brandt, Bruner, Ferguson, Franz, Freeman, Harvey, Henmon, Jastrow, Judd, Kelley, MacMillan, H. Moore, Myers, H. Peterson, Pillsbury, Pyle, Ruckmich, Ruediger, Scott, Seashore, Sylvester Thorndike, Warren, Whipple, Woodrow.

A Psychological Experiment connotes to me a careful and prolonged study of some well defined aspect of experience with subjects taken individually and with some attention devoted to a careful control of the conditions. There would be repeated trials with each subject and emphasis would be laid on detailed introspection. A Mental Test may be either mass or individual (usually the former), involves but a single trial or at most but a small number of trials, affords little chance for introspection, or at least little attention is paid to introspection, affords only a limited control of the conditions and aims to give a snap shot rather than a detailed study of the reaction. In last analysis the detailed study of the individual seems to be the chief point of difference.—Bell.

The fundamental differences are in purpose. Experiments are to test an hypothesis, law or other generalization. Mental Tests are to determine the presence or absence of a mental trait in an individual, or to measure that trait.

The differences in character between Experiments and Tests, such as the customary brevity and simplicity of procedure in tests, with less elaborate and careful control of conditions, are not universal or fundamental differences.—Bingham.

I believe the only difference between Psychological Experiments and Mental Tests is that the latter are experiments prepared by standardized methods for the purpose of comparing individuals (or groups) with each other.—Bolton.

Psychological Experiments and Investigations aim to train students to analyze mental processes into their simplest factors, in order to investigate the function of each factor in mental life and, if possible, to express their function in terms of some law or principle.

Mental Tests aim to discover individual differences in the efficiency of mental processes as a means of studying (I) the characteristics of mental growth; (II) various problems of anthropology, usually included under educational psychology such as race and sex difference, and (III) various problems of applied psychology such as the relation of individual differences to disease, to methods of learning, etc.—Brandt.

Psychological Experiments as I understand it are designed to illustrate laws of psychological phenomena. The investigations in psychology employ the experiment to arrive at general laws of mental action. Mental Tests, on the other hand, at least ought to aim at a determination of mental capacity, and should afford a differential diagnosis that would reveal striking traits and individual powers, eccentricities and deficiencies. These latter they do not yet entirely accomplish in a satisfactory way. It should clearly be the set task of clinical psychologists and all those interested in individual psychology to devise and perfect group tests and measurements that will adequately define any given individual's mental make-up.—Bruner.

Off hand, I should say that an ordinary Experiment is to demonstrate some psychological fact; that an Investigation is to inquire into some hypothesis; that a Test is to determine the status of an individual or group in a function or functions. These are not mutually exclusive, however.—Ferguson.

Psychological Investigation has the sole object of discovering new facts. Mental Tests may also (1) have this object, when the test is first devised, but usually the tests are for (2) the assimilation of more material (not necessarily the search for new things) for estimating, let us say, the mental status of a class and (3) for the determination of the mental level of a group or of an individual. While the distinction does not always hold in individual cases, the differences between investigations and tests are that

in an investigation we attempt to determine the normal and the general mental condition, in tests we are concerned with the group (and largely with the abnormal according to present day practice) mental state or level, and that in an experiment we attempt to determine something new about a mental state (or process) or a relation between states and in the test we deal more with the variation of individuals.—Franz.

No, if the Mental Tests are made in a careful manner they establish facts concerning individual differences, correlation, mental development, etc. They are different but equally advance the science.—Freeman.

I believe the names are not well chosen for the material subsumed under these two heads. As I see it, Psychological Experiments are logically devoted to the demonstration and discovery of the likenesses among mental processes. They would result when completely exemplified, in the development and demonstration of psychological laws. Mental Tests, on the other hand, are primarily and necessarily concerned with the differences in the mental processes of different subjects. One results in the formulation of psychological laws, the other emphasizes individual differences. Both resemblances and differences are necessary in any adequate study of psychology.—Harvey.

Psychological Experiments and Investigations aim to discover laws or uniformities in mental life, while Mental Tests aim, for one purpose or another, at a psychology of individuals or else of individual differences. From the standpoint of advancing our science, Psychological Experiments are more important and fundamental, while from the standpoint of practical application Mental Tests are, of course, useful. It requires psychological investigation to determine what Mental Tests test. Owing to the wide spread interest in the development and application of tests, psychological investigations have been neglected in recent years to an unfortunate extent.—Henmon.

The Psychological Experiment has for its purpose the analysis of the factors of the mental life and of the processes and mechanisms. Mental Tests are intended to throw light on the individual or the group traits which individuals or groups possess. Also to show and measure the forms of mental expression particularly as embodied in educational and vocational work. Incidentally the distribution of said traits is itself an important aspect of inquiry so that the method of tests may enter into the first division of experiments.—Jastrow.

Tests are designed to deal with groups while Experiments deal with the detailed analysis of individuals.

Tests are relatively fixed and in general cannot be elaborated in process of application; an Experiment follows up a productive lead.—Judd.

I consider in general that Psychological Experiments have as their object the revealing of the laws of mental activity and that Mental Tests have as their object the revealing of individual differences.—Kelley.

An Experiment is fundamentally concerned with (1) controlling conditions under which mental stimuli are given to the subject, (2) presenting stimuli, (3) recording reactions, and in addition in some cases the subjects observations, or general analyzing the processes called into play and interpreting the data presented.

A Test is concerned with determining how much and how that compares with a standard, or to put an individual on trial to find out how much he knows, how he feels and how much he does in certain units, how he learns, his possibilities of being changed in certain desirable ways.—MacMillan.

The Psychological Experiment proper is more likely to have reference to mental processes which are essentially general and typical; the Mental Test accentuates the fact of individual differences.—H. Moore.

First, to give more information about Human Behavior with a view better to adjust ourselves to our environment and to our fellows, and, of course, to guide others—adjustment.

Second, to select and determine individual aptitudes in order to guide the individual in finding the thing for which he is best fitted in school—and life.

The first, to constantly guide, the second, rather to select in various stages.—Myers.

Mental Tests are questions or performances designed to grade intelligence—determine the kinds and amount of intelligence present in a given person—while Psychological Experiments are controlled efforts to find causes of any mental phenomena of importance.—H. A. Peterson.

One to discover or demonstrate general principles, the other to measure individual differences.—Pillsbury.

None except in end sought. In Mental Tests, we are usually looking for individual difference and differences of development of various functions in the same individual.—Pyle.

1. I think we have to admit that in the second case there is considerable pressure from educational practice. This pressure is not intrinsically necessary, but it exists.

2. I consider that psychology and its Experimental Investigations pertain to mind in general; Mental Tests emphasize individual differences. This is again not a necessary trend, because there is a serious attempt on the part of some investigators to solve the problem of intelligence. The trend, however, is not characteristic of the group of investigators as a whole.—Ruckmich.

1. Aim to reveal the general facts and principles concerning human nature.

2. Aim to reveal the nature of the individual.—Ruediger.

"Investigations" should not be associated with "Experiments" and contrasted with "Tests."

Experiments attempt to establish norms; Tests attempt to establish norms, but also to measure individuals in terms of such norms.—Scott.

In Psychological Experiments and Investigations, the object is scientific fact as such, whereas in Mental Tests the object is information about an individual. Minor distinction can, of course, be drawn.—Seashore.

There is a difference between their aims. The first is either for research or for teaching students; the second for measurement or diagnosis of the individuals to whom applied.—Sylvester.

Psychological Experiments are to bring out a general fact or law or relation.

Mental Tests are to measure the status of an individual or group in some particular.—Thorndike.

Psychological Experiments and Investigations are primarily concerned with the type—or average—Tests with individual differences. I should say that the discoveries in the former line were more important from a scientific standpoint, while the latter are undoubtedly of greater practical value.

The Mental Tests of today do not add anything of importance to the science of psychology. They certainly will do so in the future. Furthermore, any development in psychology which proves of practical service will win support of a material and valuable character in endowments, research foundations, etc.—Warren.

When we speak of a Mental Test, we have in mind the experimental determination for a given individual of some phase of his mental capacity, the scientific measurement of some one of his mental traits. The Mental Test in some respects resembles, in some respects differs from the typical research-experiment of the psychological laboratory. The primary difference between the Research-experiment and the Test-experiment is really one of aim.—Whipple.

The object of Psychological Experiments and Investigations is to arrive at new laws and principles; the object of Mental Tests to determine the capacities of an individual. The difference is sufficiently obvious, though, of course, Mental Tests may be used in the investigation of psychological principles.—Woodrow.

5. Mental Tests fundamentally are of diagnostic value is the belief of Burnett, Henderson, Monroe, Ogden, S. Smith, Weiss.

Where Mental Tests are **under investigation**, no difference, naturally.

Where they are merely being given for **diagnostic purposes**, no more and no less gain to theory than any art confers on its fundamental science.—Burnett.

Mental Tests seem to me for the most part valuable for the diagnosis of the individual yet the knowledge of how to make them is psychological and their increasing value makes this knowledge more and more in demand among those who study psychology; also Mental Tests may afford data for psychological generalizations as in the case of correlations.—Henderson.

The former for purposes of scientific research.

The latter for purposes of diagnosis.—Monroe.

Psychological Experiments and Investigations aim to study the basic facts of mind; the principles and laws of consciousness and behavior.

Mental Tests, I have always assumed to be symptomatic, requiring more fundamental investigations for their interpretation. The diagnosis of the "tests" might, therefore, be superficial, as in the case of medical diagnosis by "symptoms"—and suggestion of problems which could only be solved by recourse to investigations of a "pure" psychological type.—Ogden.

Application. The use of standardized Experiments for individual diagnosis is Mental Testing—S. Smith.

It seems to me that Psychological Experiments should try to show how the complex modification which occurs in the mental life or actions of an individual, between birth and death, may be understood as a result of the interaction between (1) the original nature of the man, (2) his environment, (3) the properties of his own body.

Mental Tests, I regard as means for measuring and determining the social value of this modification. Mental Tests bear the same relation to Experimental Psychology as physical (bodily) measurements bear to anatomy and physiology. To make physical measurements, it is not necessary to be thoroughly prepared in medicine, but whoever wishes to use the results of such tests for diagnostic or corrective purposes should be well prepared in anatomy, physiology and pathology.—Weiss.

6. That Psychological Experiments are qualitative and Mental Tests are quantitative in their aim is the distinction made by Cowan, Gamble, Gault, Kline, Miner, Murray, Perrin, Troland, Yoakum.

Wherever Mental Tests can be reliably used as a measure or quantitative unit in connection with any conscious process it seems to me they are genuine Psychological Experiments or that they may be legitimately used in such experiments for the furtherance of knowledge of these processes. Where they merely serve as a guide to assist a given individual in his adaptation to society, I cannot see how they advance our science.—Cowan.

I have always regarded Mental Tests as a very crude form of quantitative or metric psychology.—Gamble.

Mental Tests are Psychological Experiments. We are not applying them by rule. We are first getting psychological reaction to Tests and then looking for correlation between these reactions and subsequent behavior. In the light of such correlations (or lack of them) in light of correlations among reactions to various Tests, we modify or remodify our Tests. Thus we are on the way toward establishing norms of reaction or laws. Given certain stimuli (Tests) we will obtain certain responses.—Gault.

Psychological Experiments seek to discover and describe the existence and nature of human traits; to determine the more general conditions in which they operate, etc.

Mental Tests seek quantitative expression for human traits and capacities. In brief, the former attempts to find out what exists in the way of human behavior and the laws and principles involved, the latter tries to measure what is known in the way of human behavior.

I suspect many of us are nursing the ideas that a proper selection and use of "Mental Tests" would contribute toward more successful teaching of psychology even in the more elementary courses. As the late Professor Torrey, of Harvard, taught and practiced that the best method for introducing a student to general chemistry is through a selected set of quantitative chemical problems, so the teacher of psychology may come to advocate and use Mental Tests as the more practical approach to the laws of psychology. Professor Torrey advocated this view in 1895.—Kline.

A Test is that part of a broad Psychological Experiment which provides the data in the form of a distribution of an ability. When the relations of the results of the Test are traced by correlation methods, this combined form of investigation seems to afford the most promising objective approach to the solution of problems of behavior. The other type of Experiment which aims to discover causes by changing a single factor and watching the result in a laboratory serves better in sciences dealing with simpler phenomena than in psychology.—Miner.

No essential difference if the latter are studied not only quantitatively but qualitatively with an eye to the effect of slight alteraions of method—giving of directions, etc., on the mass results and if occasionally introspections are called for. Further, I believe the limited range of subjects usually available for the classical psychological Experiments limits the validity of the results. The wider and more varied range of subjects tapped by Mental Testing obviates this difficulty.—Murray.

Many of the standard Experiments in psychology are Mental Tests, since they test abilities. I should consider problems in the learning process Mental Test problems, as they are concerned with progressive ability. Hence a line of demarcation is difficult to draw. Practically, however, a "Mental Test" is one that aims at correlating quantitative results with similar results from other tests.—Perrin.

I understand by the former the analysis of consciousness into its elements, the statement of the various relations existing between these elements, and of the correlations of the elements and their connections with physiological elements and connections. By the latter I understand practical methods for giving a quantitative estimate of "mental traits," more or less popularly conceived.—Troland.

The first, to my mind, actually study the nature of mental processes; the second, may, in the future, aid in the correlation of the facts laid bare by the first.—Yoakum.

7. Psychological Experiments are fundamentally analytic and Mental Tests synthetic according to Barnes, Breese.

The fundamental purpose of Psychological Experiments is to throw light upon mental processes for the purpose of analysis and synthesis-analysis of human behavior. The fundamental purpose of Mental Tests is to measure and grade mental ability and power—evaluation of human behavior.—Barnes.

The first is analytic while the second is synthetic.—Breese.

8. No fundamental difference is found by Angell, Brown, Fernald, Haines, Hollingworth, Hunter, Maxfield, M. Meyer, Rogers, Ruger, Strong, Wallin.

I should not naturally think of making a comparison between Mental Testing on the one hand and Psychological Tests and Experiments on the other. The establishment of the technique of Mental Testing would, in my mind, be one among other of the results of experimental investigation. The actual application of such Tests and the interpretation of the data gained might be considered either as Psychological Investigation, or as social or educational investigation. We are doing a good deal of work of all these kinds.—Angell.

I consider the employment of Mental Tests one of the most desirable methods to be used in Experiment or Investigation.—Brown.

I think that there is no fundamental difference between Psychological Experiments and Mental Tests. The distinction seems to be between the determination of facts or laws which hold generally and the study of individual and group differences. As a matter of method there are ordinarily made exact measurements under laboratory conditions in the former, and the rougher determinations to be treated by statistical methods in the latter.—Cattell.

I am not ready to grant that there are fundamental differences between Psychological Experiments and Investigations, and Mental Tests. There are unquestionably, many superficial differences resulting from the fact that laboratory conditions are frequently not available for the latter and that pressure for immediate practical application of the results is so great. I think, however, it is a mistake to feel that these factors are in-

trinsic in the conduct of Mental Tests and that Mental Tests cannot be performed as actual Psychological Experiments in the field of individual psychology.—Fernald.

I do not consider there is a fundamental difference unless the Mental Test is made an integral part of a thorough going mental or psychiatric examination. In that case the Mental Test is a means of analysis of character and assaying the individual mental make-up. The Psychological Experiment is directed to making out the typical mental organization.—Haines.

I do not consider that there is any fundamental difference. Such difference as exists is in the use to which material and results are put. Any Experiment is a sort of "test" and any "test" may be used for qualitative analysis, as well as for mere measurement.—Hollingworth.

I regard them as supplementary. There seems to be no fundamental difference. This is particularly true when one considers the more objective and less introspective Psychological Experiments.—Hunter.

A Mental Test (sic) is a Psychological Experiment in that the examiner sets certain conditions, more or less carefully standardized, and observes how the subject or group of subjects may react to the stimuli presented in these conditions. In this sense there can be no difference between the Mental Test and other Psychological Experiments not commonly so called. The difference between the activities of the clinical psychologist who uses these Tests and those of the laboratory psychologist who performs Experiments, lies not in any fundamental psychological aspects of their activities but rather in the interpretation of their results and in use to which interpretations are put. If these interpretations are used for the development of the science of human behavior we call the process by which they were derived "Psychological Experimentation." If on the other hand these interpretations of behavior data are used for determining method and practice in the process of formal education we call the process by which they were derived "experimental pedagogy."—Maxfield.

Mental Tests are a kind of Psychological Experiment.—M. Meyer.

The first class includes the second.—Rogers.

I see no vital distinction. Repeated Tests merge in Experiments on the Learning Process. The result of Tests designed to study specific mental relations, when treated by proper statistical methods, such as partial correlation, correspond in fundamental character to direct laboratory experimentation.—Ruger.

Mental Tests are only one phase of the others—dealing primarily with the problem of how various mental processes are inter-related.—Strong.

I do not think that there is any fundamental difference, but I believe the term "Mental Tests" is largely restricted to the use of Psychological Experiments for purposes of practical classification. The Psychological Experiments of the laboratory do not have this purpose. Their aim is to familiarize the student with the methods of Experimental Psychology, and to supply experimental tools for prosecuting research.—Wallin.

9. The difference is one of method of approach is the view maintained by Brigham, Delabarre, Downey, Pintner.

From the standpoint of advancing the science, Mental Tests and Psychological Experiments have the same purpose, that of obtaining a knowledge of facts of mental life such that psychological events may become predictable. The differences seem to be those of method, one method

seeking to obtain these facts by means of the introspection of an experienced observer in a controlled environmental situation, the other of obtaining these facts by observing the behavior of the individual in a series of novel situations and by correlating this behavior with the more obvious facts of physical and physiological growth, social effectiveness, etc.—Brigham.

Mental Tests seem to me to be relatively superficial and hurried Psychological Experiments, while Psychological Experiments are accurate, thorough and painstaking Mental Tests. The former are necessary when it is desirable to learn much in a limited time; and are justified when treated as approximations or when often enough repeated to offset their lesser value singly. One might call a Test even a complete and reliable Experiment of a brief type.—Delabarre.

A Mental Test and a Psychological Experiment may use the same material and study the same problem, but in the Test an effort is made to evaluate the outcome in objective terms—the degree of success in handling a problem situation. How the subject attains this success is a secondary matter; in the Experiment one stresses this How and seeks an analysis by the subject of his method of procedure. An Investigation may properly combine the Test and the Experiment. How a situation is handled is often as significant as success in handling it. In the Healy Code Test a procedure by Construction or Visualization may both give success but the different methods may evidence very different types of subject.—Downey.

I regard these as two different lines of approach, each advancing our science in its own way.—Pintner.

10. The one who finds Experiments dealing with normal adult minds, Tests with sub-normal or types of arrested or developing minds is Goddard.

The former, if we may judge from the use made of the data, are made to determine the characteristics of normal adult mind (human or animal). The latter are used to determine the status of the developing mind or of minds that have been arrested before reaching maturity.—Goddard.

11. Contributions which supplement the above and illustrate views that do not logically fall within these classes are those of Abbott, Arps, Bagley, Berry, Cleveland, Dockeray, Dodge, Haggerty, A. Meyer, Wolfe.

Mental Tests form only a limited field of Psychological Research, limited as to scope, as to method and as to amount of psychological knowledge required by the investigator in order to get results that are uniform and apparently comparable with the results of others' work. Psychological Experiments may cover any field and are limited only by the knowledge of psychology and the inventiveness of the experimenter.—Abbott.

In practice here we regard the regular work in Experimental Psychology and the work in Mental Tests as distinct. The two lines of work are carried separately by different instructors and in different laboratories. The latter borrows from, but does not affect the former. We may speak of Mental Tests **supplementing** Experimental Psychology as any course in psychology **supplements** another; certainly Mental Tests do not in any way **supplant** Experimental Psychology.—Arps.

"Experiments and Investigations"—a generic term. "Mental Tests,"—a specific term.—Bagley.

I am not sure that I understand this question; if I do, it is somewhat analagous to this question: Do you believe that the science of physiology is more likely to be advanced by the physician's endeavor to diagnose the ailments of his patients or by the physiologist's endeavors to solve the specific problems of physiology?—Baird.

At the present time "Mental Tests" seem to be the avenue along which the science of psychology can travel more rapidly, at least for a time, than by means of Psychological Experiments alone. Mental Testing is not new but the approach by the "age standard of intelligence" is new. It is this point of view that has given such an impetus to the study of Mental Tests. Another factor that makes progress along this line rapid is the practical value of the results obtained. One difficulty has been that some of those interested in Mental Tests have had little interest in the advance of psychology as a science. This has caused the conflict.—Berry.

The former is fundamental and conditions the latter.

The aim of the course and the attitude of the student are different.—Cleveland.

Psychological Experiments tend to give the student a clearer idea of the laws of mental processes, while Mental Tests do little more than indicate how certain machinery may be used, without teaching him the laws underlying the machinery.—Dockeray.

Mental Tests imply, or are supposed to imply, something different from what is measured. They should be functionally related to the processes they are supposed to test. Whenever a Test can be regarded as a true "indicator," it is of great scientific and practical value. Unfortunately many "Tests" are on the same level as the old phrenology and palm reading. They would be very valuable if the correlation had only been established.—Dodge.

Three things to consider (a) Mental Testing; (b) experimental work on Mental Tests (devising, improving, etc.); (c) other experimental work (psychological). The most important distinction is between (a) on the one hand and (b) and (c) on the other; (b) is a subdivision of (c).—Dunlap.

I regard Mental Tests as devices for measurements. One can study Mental Tests in either of two ways: (1) as an end in themselves much as a physicist would experiment in developing a micrometer screw or other measuring device; (2) the Tests may be used for the measurement of mental efficiencies. In a Psychological Experiment one may use Mental Tests as instruments for determining facts, but the experimenter is not usually interested in the Tests as such. Thus one might use Mental Tests of memory at the beginning of a training experiment and again at the end of the experiment merely as devices for measuring the changes due to practice when his main interest would be the amount and causes of such a change. —Haggerty.

I find in the main that Tests represent the ambition to study detached reactions fit to be considered without the contest as opposed to the study of reactions which require consideration of the personality and its biography. The latter stands in the center of my own interest because I have a feeling of insufficient dependability on short cuts and especially very little confidence in the quest for central correlations unless they are offered with a certain amount of distributive material presented by the individual personality.—A. Meyer.

The first is fundamental and necessary to the right appreciation of the latter. Though without the former, attempts in the latter may in a modest mind lead to a better understanding of child life. I feel that it is better for a teacher to become familiar with the child element in education, even with crude results and some misinterpretation than to continue wholly ignorant of this factor.

I do not believe a psychologist will become infected by making Mental Tests, but Psychology may suffer in the estimation of laymen.—Wolfe.

2. Factors Determining Emphasis on Psychological Experiments or on Mental Tests.

"Which of these two general lines of psychological work —Experiments or Mental Tests—are you emphasizing at present?"

Of the 100 replies to question II, 42 indicate emphasis on Mental Tests, 40 emphasis on Psychological Investigations or Experiments, and 18 indicate an equal amount of emphasis. The most patent reasons for emphasizing Mental Tests are "special facilities," "practical value," "personal interest," "best methods of advancing psychology," "students grasp them more easily," and 'they are more popular with the students." A few representative views may be quoted:

Because they are more feasible under school conditions. Even for the purposes of pure psychology extensive rather than intensive studies seem to me of greater significance at present for purposes of social orientation. Ideally, however, the two should supplement each other. After a series of tests has shown well-defined tendencies, more intensive studies should be undertaken with individuals at definite points in the series. Each one of the Binet tests, for example, should be made the subject of intensive study with individual children of different ages.—J. Carleton Bell.

I am inclined to emphasize Mental Tests. Experimental Psychology "pure and simple" gives nothing but a motive procedure.—J. E. Lough.

Mental Tests deal more directly with the functions entering into the learning process than do our laboratory experiments. Our laboratory is constantly called upon to test backward children in the public schools.—F. B. Brandt.

This is the surest method of arriving at an understanding of the normal adult mind.—H. H. Goddard.

Objective methods seem to me to avoid the danger of deadlocks from conflicting introspections.—J. B. Miner.

In an introductory course the student seems to grasp mental facts more readily in terms of mental differences than in terms of mental laws.—H. T. Moore.

Present day interest. Students are more interested in them than in introspective problems or problems concerned with the quality of mental operations. My chief reason rests upon the belief that in the field of the correlation of the results of Mental Tests we will actually make progress in the nature of mental activity.—F. A. C. Perrin.

Additional reasons for emphasizing Mental Tests are:

Because of its technological or applied value.—T. H. Haines.

Because this institution, devoted to applied science, has set me the explicit task of making psychology practical as an aid in the selection, classification, guidance and placement of its students. We use what would be called Experiments only as aids in devising, standardizing and interpreting tests, and also to a small extent as aids in teaching elementary and educational psychology.—W. V. Bingham.

Because I am in charge of a Bureau organized for the purpose of testing the extent to which Mental Tests may be useful in problems of child labor and vocational guidance.—Helen T. Woolley.

Because this laboratory was established for the individual study of delinquent women committed to the State Reformatory, with which it is affiliated. The psychological work is only one branch of this study, and is naturally concerned with problems of individual psychology.—Mabel R. Fernald.

The prevailing reasons for emphasizing Psychological Experiments or phases of research outside the field of Mental Tests are "best method of advancing the science," "personal interest," "better established," and "more important." Some selected views are:

Because I believe that Mental Tests will continue to have but limited practical value until psychology, as the science of behavior, shall have elaborated more or less satisfactorily methods for experimental analyses of capacity for adjustment in terms of the more complex functional integrations that are reflected in reaction-types. While I am interested in measuring the native reactive capacity of a dog or a monkey which has acquired a repertoire of tricks, I seek to devise experimental methods which free me from the necessity of discriminating between "trick" and "native-equipment" responses.—G. V. Hamilton.

My view is that the Psychological Experiment has for its purpose, the analysis of the factors of the mental life and of the processes and mechanisms. Mental Tests are intended to throw light on the individual or the group traits which individuals or groups possess. Also to show and measure the forms of mental expression, particularly as embodied in educational and vocational work. Incidentally, the distribution of said traits is itself an important aspect of inquiry, so that the method of Tests may enter into the first division of Experiments. As between the two, there is no question in my mind, that the first is by far the more important and should be emphasized in the teaching and training of psychologists. In my opinion it has far greater training value and analytical value; it determines the progress of psychology; it tests theories and it expands our knowledge. From this central point of view of the business of psychology, the Tests are quite subsidiary in importance and bearing.—J. Jastrow.

Experimentation because the Tests have so many questions open which can be answered only by minute progressive analysis.—C. H. Judd.

Psychological Experiments, because I think them of fundamental importance, my own inclinations are in that direction and others in the laboratory are directing their attention more to Mental Tests. I do, however, develop Tests as the outcome of my Experiments.—H. I. Langfeld.

Because I developed problems in audition and learning, some years ago, which I have not had time to complete; and I am more interested constitutionally in principles than their applications. I have refused positions in testing work for this reason—they would call me away from problems that I have not yet completed. This does not mean that I have no interest in Tests.—J. Peterson.

Because they are of most value in establishing the science of psychology, and I am interested in psychology primarily as a pure science. It is simply a matter of interest.—H. Woodrow.

As a comparative psychologist, I am laying all emphasis upon research along genetic lines. As psychologist to the Boston State Hospital, Psychopathic Department, I naturally have direction of psychological examining, and am, therefore, practically concerned with the development of Mental Tests and with their application. My interest centers in psychological research. The technological work I consider of importance, but I prefer to leave it to those who are not primarily investigators.—R. M. Yerkes.

Because, in my opinion, it is only by investigation that the science of psychology can be advanced. Because, in my opinion, the psychologist can not in the present status of his knowledge of his science do accurate or effective work on such a complex practical problem as that of Mental Testing.—J. W. Baird.

We are emphasizing Psychological Experiments and Investigations in our class work in order that the student may obtain an understanding of the work that has been done in the past, that he may realize the essential value of the introspective method in obtaining the facts of mental life, and, that in case he desires to take up research in either field of Tests or Investigations, he may have an adequate grounding in the principles of scientific method, as applied to psychological material.—H. C. Warren.

I should be very sorry to see our laboratory given over largely to a kind of work for which the experimenter certainly needs no very great amount of academic training, and which in itself cannot possibly furnish much training in psychological methods, introspective or otherwise. We are, however, doing a considerable amount of work with Intelligence Tests in response to the demand of students who expect to become social workers.—Eleanor Gamble.

3. Investigations Conducted Last Year by Members of the Association.

"Aside from Experiments given in our regular texts and laboratory manuals, will you please list as far as you deem it advisable the original experiments and investigations which were in progress last year in your laboratory?"

The purpose of assembling this information is to give an intimate insight into the scope of work that is being pursued by our members, and it is hoped that this comprehensive list of subjects will not only stimulate more research but that the investigations listed will be of direct assistance in helping to co-ordinate and correlate the problems in progress.

Since investigations vary within the same laboratory from year to year, since instructors transfer their work from one

institution to another where facilities vary, and since the investigators' interests shift from one phase of a general problem to another, it has been deemed best to classify the material in an alphabetical distribution of the investigators rather than on the basis of subject matter or method of procedure.

Angier, R. P., Yale University:

1. Retroactive inhibitions.
2. Effects of imaginative "practice" on acquiring acts of skill.
3. Influence of various Ausgaben on memory.
4. Literary versus scientific types as shown by word-association tests.
5. Distributive versus localized attention.
6. The apparent size of stars at horizon and zenits respectively.

Baird, J. W., Clark University:

1. The effect if made of presentation upon process of learning.
2. A qualitative analysis of the process of forgetting.
3. The behavior of attention in the process of observing.
4. An analysis of the consciousness of meaning and understanding.
5. Analysis of the belief-consciousness.
6. The psychology of comparing.
7. The mental antecedents of voluntary muscular contraction.
8. Forms and colors in indirect vision.
9. A correlation of results obtained by the Krasnagorski method and by the Binet-Simon method.

Baldwin, B. T., Swarthmore College and The Johns Hopkins University:

(Assisted by Eloise Rest, Louise Schrieffer, M. E. Brockman, Mary Atkinson)

1. The Psychology of Social Deviation based on the mental examination of 1,000 boys and girls.
2. An etiological study in mental retardation.
3. Intercorrelations in physical growth.
4. A critical analysis of the Yerkes-Bridges scale.
5. A survey of 500 mentally defective children in the public schools of Chester City.
6. The mental status of 1,000 normal children.

Barnes, J. C., Maryville College.

Correlation of physical and mental measurements.

Bingham, W. V., Carnegie Institute of Technology:

1. Accumulation of norms of performance in several standard tests. (Bingham and Thurstone.)
2. Development and standardization of tests of (a) ability to use ideas of spatial relations; (b) reasoning ability; (c) learning; (d) general intelligence. (Thurstone and Bingham.)
3. Research in statistical methods. (Thurstone.)
4. Investigation into the reliability of teachers' quantitative estimates of students' traits. (Miner.)

Brandt, F. B., School of Pedagogy, Phila., Pa.:

1. The correlation of our entrance Mental Tests with pooled judgments of (a) fitness to become teachers, (b) of success in practice teaching and (c) of success in teaching after graduation.

2. The correlation of "mental age" scores obtained by various methods of testing with pooled estimates of (a) mental maturity and (b) physiological maturity.
3. The standardization of the casual associates test.
4. The influence of repetition on Mental Test scores.

Bell, J. C., University of Texas:

1. The judgments of adolescent boys on the seriousness of offenses.
2. Individual differences in the solution of problems in geometry.
3. The construction of a tentative scale in algebra.
4. The construction of a tentative scale in physics.
5. The construction of a tentative scale in chemistry.
6. Individual differences in the translation of Spanish.
7. Demonstration versus experiment in the teaching of physics.
8. Correlations between neatness and accuracy in the work of the seventh grade.
9. A spelling scale for high school and college students.
10. The performance of 150 college freshmen in 10 mental and 5 pedagogical tests.

Bentley, M., University of Illinois:

1. Cardinal orientation.
2. An analytical study of perception.
3. Visual imagery and attention.
4. Extensive summation of thermal stimuli.
5. Mental functions and processes in the bee.
6. The chemical sense in the earthworm.
7. Visual rhythm.
8. Leading and legibility.
9. Adventitious associations.
10. The nature of current psychological research.
11. The problems of social psychology.
12. The crowd.
13. The audience.
14. Sensation and its bodily conditions.
15. The psychological antecedents of phrenology.
16. Dynamogenesis.
17. The psychology of Cabanis.

Berry, Charles S., University of Michigan:

1. A scale for measuring attainment in algebra.
2. A scale for measuring attainment in geometry.
3. A study of retardation, acceleration and elimination in the public schools of Michigan.
4. Testing children by means of certain association tests published by the American Psychological Association and by Healy's motor co-ordination test.

Breed, F. S., University of Michigan:

1. Experimental studies of the Montessori Method.
2. Size of class as a factor in efficiency.
3. The color appreciation of school beginners.
4. Measurement and standardization of handwriting in Highland Park, Michigan.
5. A scale for measuring composition in the sixth grade.

Breese, B. B., University of Cincinnati:

1. Tests for engineers.

Breitwieser, J. V., Colorado College:

1. Vocabulary tests.
2. An experiment in vision attempting to distinguish right or left eye vision without external factors, i. e., by means of "local sign" from the retina alone.

Burnham, Wm. H., Clark University:

1. A study of the cardiovascular index in elementary school children. (Clerk, F. E.)
2. Adolescent physical types. (Lewis, C. B.)
3. An objective study of children by the method of the conditioned reflex. (Mateer.)

Burnett, C. T., Bowdoin College:

Modification of perception—efficiency test.

Chase, H. W., University of North Carolina:

1. Preliminary work of getting local standards by which to interpret our test results.
2. Correlating in the individual, Mental Tests with measuring scales in subject matter.

Cole, L. W., Colorado University:

1. A study of association.
2. A comparison of visual and auditory memory.
3. Association by similarity.

Craig, Wallace, University of Maine:

1. Animal behavior.
2. Social psychology.

Dearborn, G. N., Sargent Normal School:

1. Relations of mentation to blood pressure.
2. Skill.
3. Dynamic ground of concepts.

Delabarre, E. B., Brown University:

1. Historico-psychological study of certain vagaries and unreliabilities of observation.

Dockeray, F. C., University of Kansas:

1. Methods of learning in children.
2. Color preferences of infants.
3. Effects of incentive or distraction upon discrimination.
4. Effects of physical fatigue after various intervals.

Dodge, Raymond, Wesleyan University:

1. Conditions of variability of a number of neuro-muscular processes, with especial reference to so-called fatigue.

Downey, June E., University of Wyoming:

1. Spatial orientation and unidexterity, including tests on degree of right and left handedness; skill with form boards; in handwriting, etc.
2. The adult tests of the Stanford revision of the Binet Scale.
3. Simultaneous reading and writing; retention of acquired skill after long lapses in practice.

Dunlap, K., Johns Hopkins University:

1. Experimental investigation of learning.
2. Association, orientation, complication-problem.

Eno, Henry, Princeton University:

1. The influence of an intense magnetic field upon the nerve-impulse as indicating the nature of the nervous process.
2. Relation between the psychic processes and the nervous processes from the standpoint of physics.
3. Optical experiments in psycho-physics.
4. Experiments in individual differences.
5. Mental Tests.

Fernberger, S. W., Clark University:

The effects of mental and physical work on the formation of judgments in lifted weight experiments.

Franz, S. I., George Washington University and Government Hospital for Insane:

1. The possibility of recovery of voluntary movement by paralytics.
2. The distribution of motor areas within the central fissure.
3. The re-education of aphasics.

Freeman, F. N., University of Chicago:

1. Studies connected with handwriting, particularly to discover the most advantageous type or phase of movement.

Gamble, E. A., Wellesley College:

1. The relative importance of mnemonic associations and spatial projections in memorizing nonsense—syllables.
2. Practice curves on writing New York Point for the blind.
3. Smell classification.

Gault, R. H., Northwestern University:

1. Study of conventionalities.
2. Investigation among delinquents.

Geissler, L. R., University of Georgia:

1. Comparison of color combinations by method of paired comparison.
2. Influence of pauses between individual repetitions on memory.
3. Association tests applied to recall of trade-marks or trade-names of familiar articles.

Haggerty, M. E., University of Minnesota:

Measuring children in the public schools by means of educational scales and tests.

Haines, Thomas H., Ohio State University, Clin. Director, Bureau of Juvenile Research:

1. Standardizing a short sentence completion test.
2. Standardizing a picture completion test.
3. Standardizing a point scale for the blind.
4. Work on the Terman vocabulary test.
5. Work on the Yerkes-Bridges point scale.

Hamilton, G. V., Stanley McCormick Grant for Research:

1. Studies of reactions to confinement under conditions which elicit the various types of searching-for-an-avenue-of-escape reactions of which the subjects (children and animals) are capable of manifesting.
2. Studies of reactions to sexual situations which are capable of a considerable degree of experimental control.

Harvey, Nathan A., State Normal College:

1. Individual differences in imaginary playmates, paramnesia, illusions of orientation, colored hearing, synesthesia, visual projection, images in reading, hallucinations, dream experiences, number forms, alphabet forms, mental calendars.

Hayes, S. P., Mt. Holyoke:

"The feeling of being stared at; character analysis by the observation method (Blackford); detection of crime by the association method; the learning process in a finger maze, in the solution of mechanical puzzles, etc.; the psy. of testimony, of advertising, of suggestion, etc.; community of ideas as shown by the assoc. method; psy. of handwriting and graphology, etc.

Healy, Wm., Chicago Psychopathic Institute:

Bronner, Augusta.

1. Psychology of testimony.
2. Psychology of special abilities and disabilities.
3. Mental conflicts.
4. Correlations of tests.
5. Study of attitude as it affects Mental Tests.

Henmon, V. A. C., University of Wisconsin:

1. Standard tests in Latin.
2. Minimum essentials in spelling.
3. Correlations between different forms of sensory discrimination, memory and association.
4. A comparative study of scholarship records of related individuals.

Hollingworth, H. L., Columbia University:

1. Judgments of photographs compared with judgments of acquaintances.
2. Relative value of segregated and distributed advertisements.
3. Correlation of tests with stenography and typewriting.
4. Correlation of tests with three factory operations.
5. Analysis of effects of practice on individual differences.
6. Study of consistency and accuracy of judgment for various materials.
7. Study of recognition memory as compared with recall.

Hunter, W. S., University of Kansas:

1. Auditory sensitivity of rat.
2. Habit interference in rat. (Hunter and Pearce.)
3. Motor rhythm in rat.
4. Studies in psycho analysis. (Yoakum.)
5. Fatigue. (Dockeray.)
6. Thought processes. (Ogden.)
7. Delayed reaction. (Carter.)

Jastrow, J., University of Wisconsin:

1. Investigations in form perception including the development of standard tests.
2. The devising of special apparatus and methods for the analysis of the perception of the third dimension.
3. Studies of aesthetic judgments.
4. Studies of logical judgments.
5. Studies of consistency in judgments with relation of sensory discrimination to higher types of judging processes.

6. Studies of formation of concepts.
7. A minute analysis of the factors in form perception as applied to the processes of identification, similarity, differences and resemblances.

Judd, Chas.:

1. On reading by means of photograph of eye movements and vocal records.
2. On arithmetic same.

In both cases learning of training is added and effects studied.

Kelley, T. L., University of Texas:

1. Mental and physical examination of boys in the State Juvenile Training School.
2. Mental and physical examination of school children suffering from malaria and hook worm.
3. Mental examination of children in State Orphan Home.
4. Mental examination of children in State School for the Deaf.
5. Mental examination of rural school children in Travis County, Texas.

Kirkpatrick, E. A., Fitchburg Normal School:

1. Studies in reading tests.

Kline, L. W., Minnesota State Normal School:

1. Space memory and motor skill.

Lough, J. E., New York University:

1. Testing backward and defective children.

MacMillan, D. T., Department of Child Study and Educational Research:

1. Tests for sensory discrimination in relation to motor-manual skill.

Meyer, Max F., University of Missouri:

1. Investigations on industrial efficiency.
2. Investigations on correlations between peculiarities of handwriting and peculiarities of general conduct.

Moore, T. V., Catholic University of America:

1. Thought and imagery.
2. Experimental aesthetics.
3. Animal psychology. (Dr. Ulrich.)

Muensterberg, Hugo, Harvard University:

Langfeld, H.:

1. Social efficiency.
2. Fatigue.
3. Optical illusions.
4. Perception of tactual movement.
5. Aesthetic types.
6. Psychophysiology of feeling.
7. Association.
8. Effects of color.
9. Individual rhythm.
10. Threshold of space perception.
11. Memory.
12. After images of movement.
13. Rhythm of prose.

Murray, Elsie, Wilson College:

1. Dream consciousness.
2. Word meanings.
3. Recall and analysis of complex emotions.

4. Recognition consciousness.
5. Practice curve in mirror script reading.
6. Generalization—matching titles and anecdotes.
7. Aesthetic values of spectrum colors.
8. Method of relative position in study of poetry.
9. Suggestion—effect on form of statement, questions, inflection, etc.
10. Associations free—effect of oral and written method on results.

Miner, J. B., Carnegie Institute of Technology:

1. Deficiency and delinquency; a study in the interpretation of Mental Testing.
2. Records of 1,000 children on a half dozen group tests.
3. Methods for estimating personal traits for use in employment office for Tech. students and graduates.

Myers, G. C., Brooklyn Training School for Teachers:

1. Reliability of student self rating and rating of one another.
2. Association and classification.
3. Does a high esteem of a trait accompany a relatively high degree of possession of that trait?
4. A search for the level in the learning curve.
5. Accuracy versus speed.
6. A-test versus not-a-test.
7. Recognition of the presence versus recognition of absence of familiar elements.
8. Studies in appetite.

Perrin, F. A. C., University of Pittsburgh:

1. The correlation between practice in Mental Tests and learning curves of other Experiments.

Peterson, Harvey A., Illinois State Normal University:

1. Measurements of the value of reviews.

Peterson, J., University of Minnesota:

1. An experiment on nature and origin of binaural beats.
2. An experiment to determine the meaning of various types of learning curves—as ball tossing.

Pillsbury, W. B., University of Michigan:

1. Studies of retroactive inhibition.
2. Effect of smoking on mental efficiency.
3. Measures of recognition.
4. Phase differences and localization of sound.
5. Problems in advertising.
6. Set of tests for animals, defectives and men.

Pintner, R., Ohio State University:

1. A scale of performance tests.
2. Standardization of picture completion test.
3. The mentality of the unemployed.
4. The mentality of pupils who are having difficulty in their school work.
5. The mentality of the deaf.

Pyle, W. H., University of Missouri:

1. Psychology of the negro.
2. Psychology of the Chinese.
3. Economical learning.
4. Inhibition.

Rosanoff, A. J., Kings Park State Hospital, N. Y.:

1. A higher scale of mental measurement.
2. Standardized free association test.

Rowland, Eleanor, Reed College:

1. Tests on memory as related to the sense organ stimulated.
2. Tests on memory in the hypnoidal state.
3. Mental Tests on delinquents.
4. Automatic movements and association.
5. Psycho-analytic experiments.

Ruckmich, Christian A., University of Illinois:

1. Human orientation in space.
2. Comparisons involving the use of artificial daylight glass.
3. Types of images. (Dr. Clark in Am. J. of Psychol., Oct. 1916.)
4. The perception of meaning.
5. Visual rhythm.
6. Various problems in comparative (animal) psychology.
7. The legibility of printed lines.

Ruger, H. A., Teachers' College:

1. Analysis of mathematical abilities.
2. Correlation of 50 or more tests on a single group of persons, the tests being of diverse character as to sub-grouping.
3. Pronunciation scale.
4. Vocational tests.
5. Transfer of printing to English.
6. Methods of learning French vocabulary.

Schmitt, Clara, Dept. of Child Study, Chicago:

1. The interpretation of test reactions of subnormal and abnormal children.

Scott, W. D., Northwestern University and Carnegie Institute of Technology:

1. Tests for vocational selection.

Seashore, C. E., University of Iowa:

1. Tonal memory.
2. Tonal imagery.
3. The perception of consonance.
4. The learning curve in singing.
5. The psycho-physics of intensity discrimination for sound.
6. The perception of rhythm.
7. Rhythmic expression.
8. A case of blue blindness.
9. The measure of merit in advertisements .
10. The sensitiveness of the blind.

Smith, F. O., University of Montana:

1. Absolute pitch.

Smith, S., University of Washington:

1. Color vision in birds.
2. Maze learning in birds (individual differences).
3. Position illusions for different parts of the visual field.
4. Age differences in cancellation tests and in auditory memory.
5. Experimental analysis of the psychology of reading.
6. Evaluation of a new scale of performance tests.

Starch, Daniel, University of Wisconsin:

1. Mental heredity.
2. Tests in languages.
3. Study of English vocabulary.
4. Possible tests in the sciences.

Strong, Edward K., George Peabody College:

1. Learning process of fourth grade children in arithmetic.
2. Effect of praise and censure on class room work. (Gilchrist.)
3. Learning to read of a child who has failed to do so after three years in school, but who was good in arithmetic.
4. Study of Binet Tests as correlated with other Mental Tests.
5. Study of Yerkes Scale as applied to adults. (Garrison.)
6. Vocational guidance for our students who go into teaching. (Strong.)
7. Standardization of Opposites Tests.

Titchener, E., Cornell Psychological Publications 1915-16; Wild, H. P.; Boring, E. G.; Dallenbach, K. M.:

1. A preliminary study of tonal volume.
2. Duration and the temporal judgment.
3. The tridimensional theory of feeling from the standpoint of typical experiences.
4. Simplicity versus complexity of color hues.
5. The gesture of affirmation among the Arabs.
6. Mechanical versus manual stimulation in the determination of the two-point limen.
7. On memorizing with the intention permanently to retain.
8. Some uses of artificial daylight in the psychological laboratory.
9. On the psychological response to unknown proper names.
10. On cutaneous after-images.
11. On Perceptive forms below the two-point limen.
12. The number of observations upon which a limen may be based.
13. Cutaneous sensation after nerve division.
14. A note on the sensory character of black.
15. On ethnological tests of sensation and perception, etc.

Wallin, J. E., Psycho-Educational Clinic, St. Louis:

1. Data bearing on Binet Scale, psychological tests, anthropometric measurements, developmental and family histories.

Warren, Howard C., Princeton University:

McComas, H. C.:
Brigham, C.:

1. Pitch discrimination in a continuous and varying tone.
2. Visual illusions in low intensities of light.
3. Discrimination time.
4. Mental Tests.
5. Illusions of reversible perspective.
6. Fatigue of attention.

Weiss, A. P., Ohio State University:

1. The conditioned-reflex.
2. The effect of caffeine and strychnine on habit formation.
3. Experiments on association word reaction.
4. Experiments on the question of increase of blood sugar in emotions.

Weiss, A. T., Ohio State University:

1. Nature and character of after images of long duration.
2. Controlled accommodation of the lens (eye) to induce illusory movement.
3. Characteristics of the tapping activity.
4. Vision of the guinea pig.
5. The size-weight illusion as dependent on the rate and rapidity of movement.
6. Effect of color adaptation upon the recognition of colors.
7. Relative intensity of tones.

Whipple, G. M., University of Illinois:

1. Usefulness of Mental Tests in diagnosing superior mental endowment, both general and specific (talents).

Wolfe, H. K., University of Nebraska:

1. On the specific brightness of colors. (Luckey, Bertha M.)
2. Cessation reactions to light and sound. (Jenkins, T. N.)
3. Weight and mass effects of color. (Conley, R. A.)
4. A study of mental imagery. (Reed, Isa D.)
5. Movement of the stimulus as a factor in perception as measured by immediate reproduction. (Warden, C. J.)

Woodrow, H., University of Minnesota:

1. Studies in practice and transference in feeble-minded and normal children of the same mental age.
2. Children's association frequency tables.
3. A new olfactometric technique.
4. Studies in reaction time and the measurement of attention.
5. Studies in the relation of physiological to mental age.
6. Studies in beats and difference tones.

Woodworth, R. S., Columbia University:

1. Association reactions.
2. Stuttering.
3. Distraction and counter-effort.
4. Influence of distraction on retention.
5. Recall versus recognition.
6. Mental effects of ventilation.
7. Psychology of trade-marks and their infringement.
8. Use of Hipp chronoscope.
9. Psychology of judgment.
10. Conditions affecting retention.
11. Mental heredity in rats.
12. Tests for typewriting ability.
13. Transfer of training.
14. Fatigue in school work.
15. Emotions and their expression.
16. Form board tests.
17. Motor tests.
18. Influence of manual training on general motor control.
19. Tests for general information.
20. Correlation between mental and physical traits.
21. Discrimination reactions.
22. Fatigue in brief periods of intense mental work.
23. Reading errors.
24. Tests for sense of humor.

Woolley, H. T., Bureau of Vocational Guidance, Cincinnati:

1. Cause and effect association test.
2. Construction puzzle tests.
3. Instruction box test. (Hayes.)
4. Puzzle box. (Freeman.)
5. Recognition test.
6. Standardization of eight blanks for association by opposites, of varying degrees of difficulty.
7. An experimental and social study of the failures in the first year of high school.

Yerkes, R. M., Harvard:

1. Problems of genetic psychology with human or infrahuman subjects.
2. Value of mental tests.
3. Methods suitable to the needs of a hospital for the insane, reformatories, prisons, etc.

Yoakum, C. S., University of Texas:

1. Animal behavior.
2. Affective memory investigations.
3. The law of prior entry.
4. Clearness.
5. Conflicts in instincts.

4. Prerequisites for Work in Psychological Experiments.

The average prerequisite for work in Psychological Experiments is 4.2 hours for 2.4 terms of 17.4 weeks. Only two institutions indicate that work prerequisite to work in Psychological Experiments is given in the Freshman year. In most institutions work is confined to the Sophomore and Junior years and in a few institutions limited to graduate work.

5. Manuals and Texts Used in Experimental Psychology.

The regular and supplementary texts used in Experimental Psychology are those of Titchener, Myers, Whipple, Sanford, Seashore, Judd, Yerkes and Holt, Hollingworth, Ladd and Woodworth, Breitwieser, Sherrington, Dunlap, Thorndike, Witmer, Langfeld and Allport, Freeman, Hoefler and Witasek and additional psychological monographs and studies.

In addition to the above texts which are accessible to all departments of Psychology, a number of excellent syllabi or guides for experimental work are printed individually by instructors or institutions. Among those who use such outlines or syllabi are Angier, Arps, Dockeray, Dunlap, Hunter, Maxfield, Meyer, Rogers, Ruckmich, Seashore, Warren, Weiss, Wilcox and Woodrow.

Summaries of three representative outlines that present interesting differences in aim, scope and methods are as follows:

For a Senior Course in Experimental Psychology, H. C. Warren and H. C. McComas, of Princeton, have formulated very careful directions for a series of 50 well selected experiments in psychology. Each experiment is particularly well outlined in detail under the divisions of Title, Problem, Apparatus, Procedure, Arrangement of Data and Remarks.

The scope of the experiments includes psychophysical methods in threshold of discrimination of visual lengths; lifted weights; visual lengths; equal differences of intensity in kinaesthetic sensations; warm and cold spots; least perceptible pressure; least perceptible difference of pressure; auditory reaction time; visual reaction time; threshold of direction of motion; sensory circles; co-ordination of touch and muscle sense; size weight illusion; tilting board; rotation table; co-ordination of equilibrium and kinaesthetic senses; automatograph; fatigue; plethysmograph; polygraph; discrimination reaction; form board; practice; highest audible pitch; interaural pitch difference; threshold of pitch discrimination; least perceptible intensity of sound; estimation of pitch intervals; localization of sound; physiology of vision; mapping the blind spot; filling out of blind spot; monocular and binocular perception of depth; distortion due to indirect vision; stereoscopic vision; relative brightness of a color and gray and two colors; least perceptible difference of saturation; visual acuity for colors; influence of experience in visual perception; association; memory; attention; reasoning.

In a printed Laboratory Outline for Experiments in General Psychology, H. S. Wilcox, of the State University of Washington, has given directions for 46 experiments including:

Mental test; physiological experiments on the human brain; the spinal cord; nerve cells; simple reflex action; experiments in sensation including cold, warmth, threshold for pain, and color mixture; after sensation of pressure; negative after images; positive after images; experiments in discrimination including pitch discrimination, finding of the tone with the highest pitch that you can hear, threshold for intensity of sound; an experiment in action demonstrating the reaction experiment; experiments in perception including the blind spot and the way it is filled out, proof reading; perception of depth including monocular vision—localization of sensations resulting from visual stimulation, binocular vision—double images with remote fixation point, binocular vision-double images with near fixation point, binocular vision-double images, binocular vision-fusion of two things to appear as one; perception of depth; perception of time including the time span and the estimation of time; attention including Wundt's experiment, class experiment, fluctuations of attention, attention and clearness; memory including auditory memory test with digits, visual memory test with digits, auditory-expression by the subject by means of articulation, auditory-visual memory test with motor expression by the subject by means of writing, comparison of the memory for sentences with the memory for words, the curve of forgetting; learning experiments including the formation of new associations,

mirror writing; voluntary control of images; uncontrolled serial association of ideas; association time for words-free association; controlled association (logical relations); reasoning experiments in puzzle and problem solving.

In a suggestive mimeographed outline comprising 27 groups of experiments, F. C. Dockeray, of the University of Kansas, approaches each exercise from five points of view—the number and name of the experiment, purpose, decsription of apparatus and its use, results and the name of the subject, and the discussion of results.

The order of the exercises is—conditions of attention; span of attention; fluctuation of attention; accommodation and inertia of attention; adequate and inadequate sense stimuli; analysis of taste qualities; sensation-olfactory; including olfactory fatigue and compound odors, fusion and compensation of odors, color tone, saturation and brightness; sensation-visual including color mixture, after images and simultaneous color contrast; sensation-auditory including threshold of discrimination of pitch and tonal fusion; sensations-intensity (Weber's Law); color preferences; exercises in perception including illusions in perception, tactual space, factors in the in perception including illusions in perception, tactual space, (1) factors in the perception of distance, (2) factors in the preparation of distance, location of sound, and perception of time intervals; association includiing imagery, sectional and entire methods of learning; distributions of repetitions in earning, and psychoanalysis; action including simple reaction times and dis-l criminative reaction times.

6. Prerequisites for Work in Mental Tests.

The prerequisites for work in Mental Tests ranges from 108 hours in the Freshman year to graduate courses based on several years of training. In some instances tests are given as part of a regular introductory course, but our replies show that the average prerequisite is 3.7 hours for 2.1 terms of 17 weeks in Sophomore, Junior or Senior years, only five institutions allowing Freshmen to take the work.

Four universities indicate that the work in Mental Tests is confined to graduate courses and several universities indicate that they are going to introduce work in Mental Tests and Measuring Scales as graduate courses.

7. Types of Mental Tests in Use.

The Mental Tests most frequently in use are those of Binet-Simon, Whipple, Terman, Thorndike, Goddard, Healy, Yerkes and Bridges, Knox, Woolley, Woodworth and Wells, Stern, Franz, Witmer, DeSanctis, Wallin, Kent-Rosanoff, DeCroly, Ries, Kraepelin, Kelley, Scott, Stenquist, Pintner, Porteus, Starch, Pyle, Sylvester, Thurston.

8. Texts Used for Work in Mental Tests.

The texts used for work in Mental Tests are those of Whipple, Binet, Yerkes-Bridges, Terman, Thorndike, Pyle, Stern, Woodworth and Wells and Healy.

9. Measuring Scales in Subject Matter.

That several members of our Association are interested in the psychological phase of methods of instruction in School Subjects and " scales " for measuring degrees of attainment is indicated by the lists of investigations included under Section II and by the programs of the contemporary meetings of Section L of the A. A. A. S.

10. " Scales " or " Standard Tests " in Use.

The " scales " or "standard tests " most frequently used are those of Thorndike (English, drawing, reading, handwriting), Courtis (arithmetic, reading, English), Ayres (handwriting, spelling), Starch (handwriting, spelling, reading), Trabue (language), Freeman (writing), Hillegas (English composition), Kelley (reading), Buckingham (spelling), Ballou (English composition), Baldwin (physical growth), Wallin (spelling), Stone (arithmetic), C. T. Gray (handwriting), Rugg (freehand lettering), Cornman (spelling), W. S. Gray (silent reading), Monroe (mathematics), Rice (spelling), Elliot (teachers' efficiency), Witham (handwriting), Boyce (teachers' efficiency), Houston (handwriting).

11. Vocational Guidance or Business Efficiency Tests.

Twenty-eight psychologists indicated that they were applying some form of psychological tests to the problem of vocational guidance or business efficiency. The aims of this work are research, the selection of men and women for positions and vocational guidance. This work is in a preliminary stage of development in general but some of the denite lines are:

Seashore's work in testing musical ability; the experiments and tests that are being applied in the Bureau of Salesmanship at Pittsburgh by Scott, Bingham, Whipple and Miner; the courses for business men by Watson in Baltimore, Adams and Breese in Cincinnati and also the juvenile research work under the direction of Mrs. Woolley.

As typical replies by a limited number to this question those of Muensterberg, Maxfield and Angell respectively are quoted.

I try to give some vocational guidance to individual students on the basis of the class experiments in Mental Tests which I give them when I discuss individual differences in my introductory psychology course.—Hugo Muensterberg.

We do not give Business Efficiency tests in the Psychological Clinic, but are frequently called upon to give vocational guidance. This is particularly true of adolescents and adults who are examined at the Clinic. The parent or social worker interested in such a case is interested in the question of what the person who is brought for examination is capable of doing, whether it is desirable to spend time in further training, etc.—Maxfield.

We are carrying on a study of a considerable group of our own students with a view to assisting them in their work, and in so far one might give an affirmative answer to your question 11. See Psychol. Rev., Monog. by Kitson (in press).—Angell.

12. Summary

I. In general, Psychological Experiments and Investigations aim to promote Psychology as a science, formulate general facts and principles, discover new truths, analyze facts of consciousness and behavior in order to secure types or averages and obtain data for an analytic systematic science.

Mental Tests represent the applied side or the technology of Psychology, emphasize individual differences and attempt to diagnose or measure what is known and to determine the qualitative growth of mental traits from year to year for individuals and groups. They are based on empirical standardizations; they are not as a rule elaborated in process of application; they supplement and throw light on the theoretical problems underlying the science and if viewed critically they become material for Psychological Investigations.

II. On the basis of our replies interest is equally distributed between experiments in general psychology and Mental Tests.

III. A list of approximately 400 investigations in progress last year by experimental psychologists shows a wide range of activity in many fields of psychology with particular emphasis on individual differences.

IV. At least 17 texts are used in Experimental Psychology and almost as many in Mental Tests.

V. On an average $1\frac{1}{2}$ years of general psychology are required for work in these fields.

VI. There is a growing tendency for educational psychologists to formulate " Measuring Scales " and at least 29 are in use.

VII. There is a growing tendency toward the application of psychology to vocational guidance and business efficiency.

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